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Survey of Automobile Operating Costs

Ministry of Treasury and Economics

CENTRAL STATISTICAL SERVICES

January 1980

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Ministry of Finance

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SURVEY OF

AUTOMOBILE OPERATING COSTS

1 INTRODUCTION

BACKGROUND

The purpose of this report is to provide reliable data on the cost components of operating and maintaining a private automobile for an average Ontario Government employee. This study[1] was requested by the Management Board Secretariat in October 1979, and is intended to be used as an input in the determination of a fair compensation rate for civil servants who use their car on government business.

SURVEY OBJECTIVES

1) To collect data in Ontario for all cost components associated with normal automobile operation.
2) To estimate the cost of automobile operation over 80,000 kilometres for each Planning Region in Ontario.

SCOPE

Automobile cost data have been compiled for the five Planning Regions in Ontario[2]. Each region has been proportionally represented by the following fifteen cities[3]:

Northwestern Ontario	Thunder Bay
Northeastern Ontario	Sault Ste. Marie, Sudbury
Southwestern Ontario	Windsor, London, Stratford
Eastern Ontario	Kingston, Ottawa
Central Ontario	Oshawa, Hamilton, Niagara Falls, Kitchener, Toronto[4], North York, Scarborough.

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[1]This report is an update of the previous study entitled "Survey of Automobile Operating Costs, January 1979".

[2]See Appendix for description of regions

[3]A stratified sampling scheme was employed, with simple random sampling of cities within region (PPS)

[4]Because Metropolitan Toronto is so large compared to other Ontario cities, it was subdivided into the Cities of Toronto, North York and its Boroughs For purposes of this survey, each borough was considered a city

In each region, cost data have been compiled for three automobile size categories:- compact, intermediate, full-size.

ASSUMPTIONS

To arrive at any meaningful determination of average automobile operating costs, certain assumptions are necessary with respect to types of cars selected, options, kilometres driven, insurance coverage, trade-in value, etc. The following assumptions are used in this study:

- The study is limited to the types of 1980 cars specified in Table 1;
- Employees pay the full retail price for their new car (including options) See Table 2;
- When trading in an old car, employees receive the average wholesale price as specified in the Canadian Red Book;
- The type of insurance coverage is specified under "Insurance";
- When financing a new car, employees will borrow the amount of money necessary to replace their old car with a new car of similar make and model;
- The type of gasoline used is regular unleaded;
- Employees will trade their car in at 80,000 kilometres whether driven in 1, 2, 3 or 4 years;
- New 1980 cars will depreciate in the same ratio as previous years' models.

II AUTOMOBILE OPERATING COSTS

The cost of operating and maintaining an automobile can be broken down into two distinct categories, fixed and variable.

a. Fixed costs are automobile expenses incurred regardless of the number of kilometres driven and include depreciation, insurance, finance charges, licence fee, freight charge and provincial sales tax.

b. Variable costs are expenses directly related to the number of kilometres driven and vary from car to car, type of driving and geographical location. Variable costs consist of maintenance, gasoline and tires.

a. FIXED COSTS

DEPRECIATION:

Automobile depreciation is the loss in car value. It is the difference between what the purchaser paid for his car and what he received when it was traded. Depreciation is the major cost component of automobile operation, accounting in four years for up to almost 60% of the original car value.

In this study, depreciation is defined as the difference between the old car list price and the average wholesale value at trade-in time. Because most people pay less than the list price for a car (several hundred dollars less for a full-size car), depreciation tends to be overstated by this amount:

Depreciation = (List Price - Average Wholesale Value)

Table I provides a list of 1980 automobiles selected for analysis, while Table 2 gives a breakdown of 1980 automobile retail prices, including options. The total list price includes federal sales tax but excludes provincial sales tax, freight charges and license fees.

Total automobile depreciation costs over a four year period[1] are provided in Table 3. Data was obtained by subtracting for each year the present used-car value (average wholesale value) from the appropriate new car list price. For example, depreciation for a three year old compact was obtained by subtracting the average present used-car value for 1977 compacts from the average 1977 compact list price ($4814-2883=$1931).

Average wholesale value is the average trade-in value of a car when sold to an automotive dealer. It represents used car values with average kilometres driven, ready for resale. Reconditioning costs are included. Cost adjustments should be made for extra equipment, repairs or replacements required, kilometres travelled and geographical areas[2].

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[1] 1979, 1978, 1977, 1976

[2] Canadian Red Book

Table 4 shows the percentage depreciation of automobiles at the end of each model year. The expected depreciation of 1980 automobiles over a four year period is shown in Table 5. Note that average depreciation costs by car size now include an adjustment for mileage. For automobiles driven 80,000 kilometres in one year, add $450 to depreciation costs; in two years add $225; in three years no change; in four years subtract $225. Because of the adjustment for mileage component, depreciation costs may not change considerably for some years.

In Table 18 a further adjustment was made in depreciation to take into account geographical area. For Southern Ontario subtract 2%; for Northern Ontario subtract 5% from depreciation, and for Central Ontario, no change.

AUTOMOBILE SELECTION

Three size ranges of automobiles were selected for analysis (compact, intermediate and full-size). A representative sample of cars was selected for each category with a total of 17 cars being considered (See Table 1). To maintain consistency with previous studies[1], every effort was made to select comparable automobiles.

Automobile selection was based upon the following criteria:

- lowest priced model in each line
- 4-door sedan
- automatic transmission
- power steering
- power brakes
- radio
- 8 cylinder for full-size and intermediate
- 6 cylinder for compact.

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[1] Survey of Automobile Operating Costs (January 1979)
Mileage Rate Survey (December 1977)
Automobile Mileage Allowances, Component Costs 1976

METHOD OF CALCULATING DEPRECIATION

In deriving estimates of depreciation for 1980 automobiles, ratios were developed based upon the depreciation of similar models in previous years. It was assumed that a 1980 auto will depreciate in one year the same percentage amount as a one year old 1979 car; in two years a 1980 will depreciate the same percentage amount as a two year 1978 car, similarly for three and four years. For example, 1979 full-size automobiles depreciated 34.5% in one year, while 1978, 77 and 76 autos depreciated 37.9%, 45.7% and 59.2% respectively over two, three and four years. Similarly, an average full-size 1980 auto is expected to depreciate $3,235 in the first year and $3,285, $3,689 and $4,554 over the second, third and fourth years respectively. See Table 5.

DEPRECIATION VERSUS REPLACEMENT COSTS

Replacement cost is the amount of money necessary to replace the present automobile with a new 1980 car (similar make, model and options). It can be defined as the difference between the new car price and the average wholesale value of the old car. If the price of cars did not increase with each new model year, then replacement cost would equal depreciation cost. However, because of an inflationary economy, replacement costs have been greater than depreciation by the amount of price increase..

DEPRECIATION=REPLACEMENT COST-PRICE CHANGE

Example: The list price of a basic 1973 Pontiac (4 door sedan) was $5,139, but in December 1979 it was worth only $725 (AWP). A 1980 Pontiac Laurentian retails at $7,531:

Replacement cost is	$6,806	($7,531-$725)
Depreciation cost is	$4,414	($5,139-$725)
Difference is	$2,392	

INSURANCE

Insurance expenses also comprise a major portion of the operational cost of an automobile. The cost of insurance can vary considerably, depending upon insurance company, coverage, automobile, driver, driving habits and geographical location.

Table 6 lists insurance rates for 1980 cars by car size and city. The quotations are based upon I.A.O.[1] suggested rates. In calculating insurance costs over a 4 year period, it was assumed that rates do not change.

In estimating average insurance rates, the following assumptions were made with respect to type of car, driver status and insurance coverage:

1. Car type Chevrolet (Bel Air, Malibu and Citation) were assumed to be representative of cars in each size category. Each car was a 4 door sedan, equipped with automatic transmission, power brakes and steering, radio, 8 cylinders (except for Citation which has 6 cylinders).
2. Driver - the car driver particulars are: class 7[2], travels for business, no speeding tickets, 3 years accident free.
3. Insurance - Coverage consists of $500,000 liability, $100 deductible collision, $25 deductible comprehensive, accident benefits.

LICENCE FEES

The cost of 1980 automobile licences remained at $45.00 for 6 cylinders and $60.00 for an 8 cylinder car. In Northern Ontario, licence fees are $10.00 regardless of the number of cylinders. See Table 7 for a breakdown by engine type and area.

PROVINCIAL SALES TAX

To obtain a more accurate representation of depreciation, provincial sales tax has been broken out as a separate item in automobile fixed costs. See Table 18.

DESTINATION CHARGES

Destination or freight charges are automobile delivery costs charged to the dealer. These costs vary from city to city and are passed on directly to the consumer. Table 8 lists the

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[1] Insurers' Advisory Organization of Canada.

[2] Single over 30 or married over 25.

destination charges by automobile manufacturer for each of the five Planning Regions.

FINANCE CHARGES

It is estimated that about 80% of car owners finance their car purchase by taking out installment loans.[1] The interest charges on these loans must be considered a real cost of automobile ownership.

In financing the purchase of a new car, it is assumed that the employee will borrow the replacement cost for a new car and will repay the loan over the period that he owns the car. For example, if an employee owns a car for only one year, he will repay the total loan[2] in that period, similarly for two, three and four years.

Table 9 shows the average replacement cost (including provincial sales tax) by car size and time period, while Table 10 shows the finance costs involved, based upon an interest rate of 16.0%[3] calculated on the declining balance.

b. VARIABLE COSTS

MAINTENANCE:

In this study, automotive maintenance is defined as the amount of normal maintenance required to keep an automobile in good operating condition, excluding any repairs due to faulty parts, accidents or abnormal wear and tear[4]. Specifically, normal automotive maintenance consists of the following components:

- oil change and lube every 5,600 kilometres[5]
- rotate and balance tires " 24,000 "
- wheel alignment " 24,000 "
- suspension " 52,000 "
- automatic transmission " 80,000 "
- brake job " 52,000 "

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[1] The Time-Life Book on the Family Car, Time-Life Books, 1973

[2] Replacement cost for a 1 year old auto

[3] Telephone survey of 4 banks, November 26, 1979

[4] This survey is an update of an earlier maintenance survey entitled "Automobile Mileage Allowances, Component Costs" 1976

[5] Frequency of repair estimates are based upon 1979 automobile maintenance schedules and previous survey

- exhaust system every 60,000 kilometres
- tuneup " 24,000 "
- unspecified repairs[1]

In December 1979, a field survey was conducted in Ontario by personal interview to determine the cost of normal automotive maintenance over an 80,000 kilometre period[2]. Data was collected for three types of intermediate automobiles - Ford Granada, Chevrolet Malibu and Dodge Diplomat.

A sample of 35 dealerships was selected. These new car dealerships represented either Ford, GM or Chrysler, and were located in 15 cities and 5 Planning Regions across Ontario[3].

The results of the survey show that the average maintenance cost in Ontario over 80,000 kilometres was $1,515.[4] Table 11 provides a summary of the results by region, while Table 12 gives a more detailed breakdown of maintenance costs by city.

TIRES

The life of a tire depends upon driver habits, road conditions and tire construction. Most 1980 automobiles come equipped with steel-belted radials. These tires have been estimated to last at least 60,000 kilometres.

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1 Unspecified repairs are estimated to be 10% of the total maintenance cost over 80,000 kilometres and include all repair work not elsewhere specified or for which frequency of occurrence estimates were not possible (e.g. alternator, batteries, radiator, fluids, electrical etc.) Included also are such expenditures as towing and cleaning

2 A more complete description of this survey, including survey design and methodology, is provided in the report "Survey of Automobile Maintenance Costs" January 1980

3 A stratified sampling scheme was employed. See 2

4 Last year's survey was based upon a 1976 survey, using 1976 automobiles with annual adjustments employing the CPI. The 1980 survey was based upon 1979 automobiles and incorporated the automotive technology which has been introduced since 1976 (e.g. electronic ignition, radial tires, no major tuneups, different maintenance schedules etc.) As a result, 1980 maintenance costs are approximately 15% less than those which would have been estimated using the 1976 survey

To determine the cost of replacement tires, a survey of ten tire retail establishments was conducted in the Toronto area. The survey obtained at least three price quotations for six different manufacturers of tires. Table 13 shows the average retail prices by manufacturer for a GR 78-15 (215-75-15) white wall radial. A set of steel-belted radial tires will cost approximately $369.00.[1]

GASOLINE

The cost of fuel for an automobile depends primarily upon the price per litre and the size and efficiency of the car engine. The average price of gasoline (regular unleaded and super unleaded) in each of fifteen cities was obtained by means of a telephone survey conducted during the week of January 7-11, 1980.

It was estimated, with a confidence interval of .95, that a sample of twelve retail outlets per city would result in the sample mean price being within ± .5¢ of the actual gasoline price. The yellow pages of the telephone directories served as a sample frame from which outlets were randomly selected.

Gasoline consumption rates for 1980 automobiles were derived from 1980 Transport Canada data.[2] The fuel economy data in Table 16 were adjusted downwards by 20%[3] to reflect more realistic Canadian driving conditions.[4] Intermediate and full-size automobiles have similar fuel economies because a comparable size engine is usually installed in both types of cars.

Tables 14 and 15 show the price of gasoline by city and by region, while Table 16 shows the gasoline consumption rates for various sizes of automobiles. The total gasoline expenditure by region and car size over 80,000 kilometres is given in Table 17.

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[1] Survey conducted December 17, 1979

[2] 1980 Fuel Consumption Guide, Transport Canada

[3] Management Board Secretariat estimate

[4] The Guide specifies that fuel economy data is intended only for use in making comparisons between various automobile makes and models and that actual fuel consumption rates will probably be lower, depending upon climate, vehicle condition and type of driving.

III CONCLUSION

Based on the assumptions established at the beginning of this report, the average cost of operating and maintaining an intermediate size automobile in Ontario is broken down as follows:

	1 Year	2 Years	3 Years	4 Years
		(¢/km)		
Southern Area	11.81	13.11	14.93	16.70
Northern Area	11.73	12.95	14.70	16.43

Because some of the major fixed and variable cost components are less in Northern Ontario, total operating costs in the North are slightly lower for all car sizes and years. For example, automobiles in the North depreciate about 5% less than similar cars in Toronto, and 3% less than other Southern Ontario areas. However, this cost differential tends to be offset by higher freight, gasoline and insurance charges in the North.

Over a 4 year 80,000 kilometre period full-size automobiles cost 19.03 cents per kilometre to operate in the South compared to 18.68 cents per kilometre in the North. Although fuel economies are similar to intermediates, depreciation and finance charges are higher for full-size cars. For example, an average intermediate depreciates about 47% in four years, whereas a full-size car will lose 59% of its value over the same period.

Lower depreciation and fuel costs are reflected in the lower operating expenses for compact automobiles. Over a four year period, compact cars average 15.07 cents per kilometre in Southern Ontario and 14.89 cents per kilometre in the North.

Table 18 provides a complete breakdown of vehicle operating costs by type, region, year and automobile size. The figures consider the total cost of driving over 80,000 kilometres whether driven in 1, 2, 3 or 4 years.

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Table 1

SELECTED 1980 AUTOMOBILE MODELS

1.	Dodge	4.	Chevrolet
	Newport (Chrysler)		Bel Air
	Diplomat		Malibu
	Aspen		Citation
2.	Plymouth	5.	Pontiac
	---		Laurentian
	Caravelle		Lemans
	Volare		Phoenix
3.	Ford	6.	Mercury
	Custom LTD S		Marquis
	Granada		Cougar
	Fairmont		Monarch

Table 2

1980 NEW CAR PRICES

	List Price	Automatic Transmission	Power Steering	Power Brakes	Engine (V8)	Radio	TOTAL
	$	$	$	$	$	$	$
Newport	8318	STD	STD	STD	322	118	8758
Diplomat	6876	STD	STD	STD	318	116	7310
Aspen	5883	STD	STD	92	-	108	6083
Caravelle	6857	STD	STD	STD	318	116	7291
Volare	5878	STD	STD	92	-	108	6078
Custom LTD S	7846	STD	STD	STD	STD	107	7953
Granada	6155	388	188	88	244	107	7170
Fairmont	5634	388	188	88	267 (V6)	107	6672
Marquis	7886	STD	STD	STD	STD	90	7976
Cougar	8089	STD	STD	STD	244	STD	8333
Monarch	6224	388	173	80	-	90	6955
Bel Air	7384	STD	STD	STD	265	119	7768
Malibu	6143	421	204	STD	265	117	7150
Citation	5961	398	193	90	266 (V6)	STD	6908
Laurentian	7531	STD	STD	STD	265	119	7915
Lemans	6258	421	204	STD	265	117	7265
Phoenix	6074	399	193	90	266 (V6)	STD	7022

Source: Survey of Toronto automobile dealerships, November 26-29, 1979.

Table 3

DEPRECIATION COSTS[1]
OVER 4 YEARS

Car Size	Total Depreciation Costs Over			
	1 Year	2 Years	3 Years	4 Years
	$	$	$	$
Compact	1783	1668	1931	1776
Intermediate	2069	2154	2385	2400
Full-size	2585	2517	2675	3328

Source: Canadian Red Book

[1]Depreciation costs were derived for each year by subtracting present used-car value (November 1979) from the appropriate new car list price.

Table 4

PERCENTAGE DEPRECIATION
OVER 4 YEARS

Car Size	Percentage Depreciation Over			
	1 Year	2 Years	3 Years	4 Years
	%	%	%	%
Compact	29.9	31.3	40.1	41.9
Intermediate	30.9	34.4	41.4	46.6
Full-size	34.5	37.9	45.7	59.2

Table 5

EXPECTED DEPRECIATION COSTS
1980 AUTOMOBILES

Car Size	List Price[1]	Total Depreciation Costs[2] Over			
		1 Year	2 Years	3 Years	4 Years
	$	$	$	$	$
Compact	6619	2429	2296	2654	2548
Intermediate	7419	2742	2777	3071	3232
Full-size	8074	3235	3285	3689	4554

1. 1980 average list price including options (excluding provincial sales tax and freight charges). December 1979.
2. Includes adjustment on depreciation for mileage component; 80,000 kms. in 1 year = + 450, 2 years = + $225, 3 years = 0, 4 years = - $225. Derived from table 4.

Table 6

INSURANCE RATES FOR 1980

Region **	Automobile Size*		
	Full-Size	Intermediate	Compact
	$	$	$
Northwestern	581	581	581
Northeastern	578	578	578
Southwestern	566	566	566
Eastern	566	566	566
Central	573	573	573

* Insurance quotes based on 1980 Chevrolet Bel Air, Chevelle Malibu, Chevy Citation.

**Regions represented by the following cities: Thunder Bay, Sault Ste. Marie, Sudbury, London, Ottawa and Toronto.

Source: Ministry of Consumer and Commercial Relations, Office of the Superintendent of Insurance (I.A.O. rates).

Table 7

MOTOR VEHICLE REGISTRATION FEES FOR
1980 PASSENGER VEHICLES

Engine type	Southern Ontario	Northern* Ontario
4 cylinders	$30.00	$10.00
6 cylinders	$45.00	$10.00
8 cylinders	$60.00	$10.00

* Northern Ontario includes those portions lying north and west of the Mattawa River, Lake Nippissing and the French River, and including the District of Manitoulin. (The cities of Thunder Bay, Sault Ste. Marie and Sudbury all lie within this region).

Source: Ontario Budget 1977.

Table 8

AUTOMOBILE DESTINATION CHARGES

Region	GM	FORD	CHRYSLER	AVERAGE
Northwestern	279	279	323	294
Northeastern	193	187	213	198
Southwestern	184	178	167	176
Eastern	178	170	176	175
Central	150	144	160	151

Source: Telephone survey of 3 dealerships in each of 15 cities. Costs per region are weighted by city population. Destination charges are the same for each type of car regardless of size.

Table 9

AVERAGE AUTOMOBILE REPLACEMENT COSTS[1]

Car Size	1 Year	2 Years	3 Years	4 Years
	$	$	$	$
Compact	2900	3442	4200	4625
Intermediate	3313	3838	4613	5238
Full-size	3730	4520	5460	6350

1. Replacement costs were obtained by subtracting used car values for previous years' models from 1980 list car prices (including 7% sales tax).

Table 10

AVERAGE FINANCE CHARGES[1]

Car Size	1 Year	2 Years	3 Years	4 Years
	$	$	$	$
Compact	249	582	1075	1602
Intermediate	285	649	1181	1814
Full-size	321	764	1397	2200

1. Finance charges are based upon a bank rate of 16.0%.

Table 11

SUMMARY OF
AUTOMOTIVE MAINTENANCE COSTS BY REGION*

Region	Total Cost $	¢/Km
Northwestern	1479	1.85
Northeastern	1463	1.83
Southwestern	1571	1.96
Eastern	1497	1.87
Central	1517	1.90
Average		
Southern Ontario	1520	1.90
Northern Ontario	1467	1.83
Overall	1515	1.89

*Total cost over 80,000 km., tires excluded. Derived from data in Table 12. Data weighted by city/region population.

Table 12

AUTOMOTIVE MAINTENANCE COSTS
OVER 80,000 KILOMETRES
BY CITY

CITY:- THUNDER BAY

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost
		Every (Km)	Times	$
Oil Change & Lube	19.07	5,600	14.3	272.70
Rotate & Balance Tires	22.00	24,000	3.3	72.60
Wheel Alignment	27.30	24,000	3.3	90.09
Suspension	113.61	52,000	1.5	170.42
Transmission	38.39	80,000	1.0	38.39
Brakes	124.88	52,000	1.5	187.32
Exhaust System	192.54	60,000	1.3	250.30
Tune-up	79.77	24,000	3.3	263.24
Unspecified Repairs (10%)				134.51
TOTAL				1,479.57

CITY:- SAULT STE. MARIE

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost
		Every (Km)	Times	$
Oil Change & Lube	18.90	5,600	14.3	270.27
Rotate & Balance Tires	25.50	24,000	3.3	84.15
Wheel Alignment	21.32	24,000	3.3	70.36
Suspension	97.20	52,000	1.5	145.80
Transmission	48.08	80,000	1.0	48.08
Brakes	183.49	52,000	1.5	275.24
Exhaust System	184.65	60,000	1.3	240.05
Tune-up	81.09	24,000	3.3	267.60
Unspecified Repairs (10%)				140.16
TOTAL				1,541.71

TABLE 12
AUTOMOTIVE MAINTENANCE COSTS
OVER 80,000 KILOMETRES

CITY:- SUDBURY

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost
		Every (Km)	Times	$
Oil Change & Lube	20.17	5,600	14.3	288.43
Rotate & Balance Tires	25.20	24,000	3.3	83.16
Wheel Alignment	19.45	24,000	3.3	64.19
Suspension	83.61	52,000	1.5	125.42
Transmission	38.40	80,000	1.0	38.40
Brakes	150.11	52,000	1.5	225.17
Exhaust System	162.76	60,000	1.3	211.59
Tune-up	71.86	24,000	3.3	237.14
Unspecified Repairs (10%)				127.35
TOTAL				1,400.85

CITY:- WINDSOR

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost
		Every (Km)	Times	
Oil Change & Lube	22.02	5,600	14.3	314.89
Rotate & Balance Tires	25.50	24,000	3.3	84.15
Wheel Alignment	26.48	24,000	3.3	87.38
Suspension	114.51	52,000	1.5	171.77
Transmission	51.59	80,000	1.0	51.59
Brakes	150.51	52,000	1.5	225.77
Exhaust System	198.75	60,000	1.3	258.38
Tune-up	111.31	24,000	3.3	367.32
Unspecified Repairs (10%)				156.13
TOTAL				1,717.38

TABLE 12
AUTOMOTIVE MAINTENANCE COSTS
OVER 80,000 KILOMETRES

CITY:- LONDON

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost $
		Every (Km)	Times	
Oil Change & Lube	18.68	5,600	14.3	267.12
Rotate & Balance Tires	19.98	24,000	3.3	65.93
Wheel Alignment	17.82	24,000	3.3	58.81
Suspension	96.87	52,000	1.5	145.31
Transmission	62.46	80,000	1.0	62.46
Brakes	165.16	52,000	1.5	247.74
Exhaust System	177.26	60,000	1.3	230.44
Tune-up	75.98	24,000	3.3	250.73
Unspecified Repairs (10%)				132.85
TOTAL				1,461.39

CITY:- STRATFORD

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost $
		Every (Km)	Times	
Oil Change & Lube	19.90	5,600	14.3	284.57
Rotate & Balance Tires	23.66	24,000	3.3	78.08
Wheel Alignment	18.30	24,000	3.3	60.39
Suspension	87.25	52,000	1.5	130.88
Transmission	43.46	80,000	1.0	43.46
Brakes	158.47	52,000	1.5	237.71
Exhaust System	227.05	60,000	1.3	295.17
Tune-up	75.00	24,000	3.3	247.50
Unspecified Repairs (10%)				137.78
TOTAL				1,515.54

TABLE 12
AUTOMOTIVE MAINTENANCE COSTS
OVER 80,000 KILOMETRES

CITY:- KINGSTON

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost
		Every (Km)	Times	$
Oil Change & Lube	15.20	5,600	14.3	217.36
Rotate & Balance Tires	24.50	24,000	3.3	80.85
Wheel Alignment	19.00	24,000	3.3	62.70
Suspension	83.00	52,000	1.5	124.50
Transmission	38.55	80,000	1.0	38.55
Brakes	166.00	52,000	1.5	249.00
Exhaust System	138.46	60,000	1.3	180.00
Tune-up	71.15	24,000	3.3	234.80
Unspecified Repairs (10%)				118.78
TOTAL				1,306.54

CITY:- OTTAWA

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost
		Every (Km)	Times	$
Oil Change & Lube	22.29	5,600	14.3	318.74
Rotate & Balance Tires	16.25	24,000	3.3	53.63
Wheel Alignment	15.71	24,000	3.3	51.84
Suspension	83.54	52,000	1.5	125.31
Transmission	39.59	80,000	1.0	39.59
Brakes	178.20	52,000	1.5	267.30
Exhaust System	201.02	60,000	1.3	261.33
Tune-up	84.64	24,000	3.3	279.31
Unspecified Repairs (10%)				139.71
TOTAL				1,536.76

TABLE 12
AUTOMOTIVE MAINTENANCE COSTS
OVER 80,000 KILOMETRES

CITY:- OSHAWA

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost
		Every (Km)	Times	$
Oil Change & Lube	22.28	5,600	14.3	318.60
Rotate & Balance Tires	21.73	24,000	3.3	71.71
Wheel Alignment	19.73	24,000	3.3	65.11
Suspension	105.63	52,000	1.5	158.45
Transmission	42.25	80,000	1.0	42.25
Brakes	168.35	52,000	1.5	252.53
Exhaust System	210.80	60,000	1.3	274.04
Tune-up	70.44	24,000	3.3	232.45
Unspecified Repairs (10%)				141.51
TOTAL				1,556.65

CITY:- HAMILTON

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost
		Every (Km)	Times	$
Oil Change & Lube	19.53	5,600	14.3	279.28
Rotate & Balance Tires	24.90	24,000	3.3	82.17
Wheel Alignment	19.95	24,000	3.3	65.84
Suspension	92.90	52,000	1.5	139.35
Transmission	37.78	80,000	1.0	37.78
Brakes	161.58	52,000	1.5	242.37
Exhaust System	183.52	60,000	1.3	238.58
Tune-up	67.58	24,000	3.3	223.01
Unspecified Repairs (10%)				130.83
TOTAL				1,439.22

TABLE 12
AUTOMOTIVE MAINTENANCE COSTS
OVER 80,000 KILOMETRES

CITY:- NIAGARA FALLS

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost
		Every (Km)	Times	$
Oil Change & Lube	24.03	5,600	14.3	343.63
Rotate & Balance Tires	19.60	24,000	3.3	64.68
Wheel Alignment	20.95	24,000	3.3	69.14
Suspension	97.60	52,000	1.5	146.40
Transmission	54.09	80,000	1.0	54.09
Brakes	135.27	52,000	1.5	202.91
Exhaust System	207.60	60,000	1.3	269.88
Tune-up	75.95	24,000	3.3	250.64
Unspecified Repairs (10%)				140.14
TOTAL				1,541.51

CITY:- KITCHENER

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost
		Every (Km)	Times	$
Oil Change & Lube	21.39	5,600	14.3	305.88
Rotate & Balance Tires	25.75	24,000	3.3	84.98
Wheel Alignment	22.48	24,000	3.3	74.18
Suspension	91.66	52,000	1.5	137.49
Transmission	28.34	80,000	1.0	28.34
Brakes	163.23	52,000	1.5	244.85
Exhaust System	209.83	60,000	1.3	272.78
Tune-up	89.64	24,000	3.3	295.81
Unspecified Repairs (10%)				144.10
TOTAL				1,588.74

TABLE 12
AUTOMOTIVE MAINTENANCE COSTS
OVER 80,000 KILOMETRES

CITY:- TORONTO

Type of Maintenance	Average Cost $	Frequency of Repair		Total Cost $
		Every (Km)	Times	
Oil Change & Lube	19.84	5,600	14.3	283.71
Rotate & Balance Tires	20.55	24,000	3.3	67.82
Wheel Alignment	20.87	24,000	3.3	68.87
Suspension	94.68	52,000	1.5	142.02
Transmission	41.89	80,000	1.0	41.89
Brakes	164.58	52,000	1.5	246.87
Exhaust System	222.71	60,000	1.3	289.52
Tune-up	74.39	24,000	3.3	245.49
Unspecified Repairs (10%)				138.62
TOTAL				1,524.81

Table 13

AVERAGE RETAIL TIRE PRICES

Manufacturer	Type	Price*
Goodyear	Steel-Belted Radial	98.50
Firestone	Whitewall	96.70
General	GR78-15	88.63
Goodrich	P215-75-15 (metric)	90.20
Uniroyal		88.73
Michelin		90.58
	Average	$92.22

* Price shown is the average of 3 individual dealer quotations.

Source: Survey of Toronto tire manufacturers during week of December 17-21, 1979. Assumed that tire prices same throughout Ontario.

Table 14

RETAIL GASOLINE PRICES

By City

City	Regular Unleaded ¢/L	Super Unleaded ¢/L
Thunder Bay	26.3	27.2
Sault Ste Marie	26.4	27.9
Sudbury	26.6	27.9
Windsor	26.6	27.0
London	25.8	27.0
Stratford	25.9	26.9
Kingston	26.3	27.2
Ottawa	26.0	27.3
Oshawa	26.2	27.3
Hamilton	25.5	26.7
Niagara Falls	25.6	27.1
Kitchener	26.1	27.3
Toronto	25.8	27.1
North York	25.8	26.8
Scarborough	25.7	26.8
Average[1]		
Southern cities	26.0	27.0
Northern cities	26.4	27.7
Overall	26.0	27.1

[1]Weighted by population.

Source: Survey of approximately 180 gasoline stations conducted during week of January 7-11, 1980

Table 15

RETAIL GASOLINE PRICES
By Region[1]

Region	Regular Unleaded	Super Unleaded
	¢/L	¢/L
Northwestern	26.3	27.2
Northeastern	26.5	27.9
Southwestern	26.1	27.0
Eastern	26.1	27.3
Central	25.8	27.0

[1] weighted by city population

Table 16

GASOLINE CONSUMPTION RATES

Car	Combined km/gal.*	Combined Mi./gal.**	Engine Size Litres
Compact			
Aspen	32	20	3.7
Volare	32	20	3.7
Fairmont	35	22	3.7
Monarch	28	17	4.1
Citation	34	21	2.8
Phoenix	34	21	2.8
Intermediate			
Diplomat	27	17	5.2
Caravelle	27	17	5.2
Granada	27	17	5.0
Cougar	31	19	5.0
Malibu	31	19	5.0
LeMans	31	19	5.0
Full-size			
Newport	27	17	5.2
Custom 500	29	18	5.0
Marquis	29	18	5.0
Bel Air	27	17	5.0
Laurentian	27	17	5.0
Average			
Compact	32	20	
Intermediate	29	18	
Full-size	28	17	

* Combined km/gal. is based on a ratio of 55/45 city-highway driving

** Rounded to nearest MPG. 1 km = .62137 miles

Source: 1980 Fuel Consumption Guide, Transport Canada, October 1979. Fuel economy data were adjusted downwards by 20% to reflect actual driving costs.

Table 17

GASOLINE COSTS OVER 80,000 KILOMETRES
BY REGION

Region[1]	Compact	Intermediate	Full-size
	$	$	$
Northwestern	2990	3299	3417
Northeastern	3010	3321	3440
Southwestern	2968	3274	3391
Eastern	2968	3274	3391
Central	2933	3236	3351
Southern Ontario	2938	3242	3357
Northern Ontario	3004	3314	3433
Overall	2945	3249	3365

Source: Telephone Survey in Ontario conducted during week of Jan. 7-11, 1980. Total Cost = $\frac{80,000 \text{ Km.}}{\text{Km/Gal}}$ x Price of Unleaded Gasoline

[1] weighted by population

SUMMARY OF
TOTAL VEHICLE OPERATING COSTS Table 18

Region: NORTHWESTERN ONTARIO

CAR TYPE: Compact

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	2308	2.89	2181	2.73	2521	3.15	2420	3.02
Insurance	581	.73	1162	1.45	1743	2.18	2324	2.91
Finance	249	.31	582	.73	1075	1.34	1602	2.00
Licence	10	.01	20	.02	30	.03	40	.05
Sales Tax	463	.58	463	.58	463	.58	463	.58
Freight Charge	294	.37	294	.37	294	.37	294	.37
Gasoline	2990	3.73	2990	3.73	2990	3.73	2990	3.73
Maintenance	1479	1.85	1479	1.85	1479	1.85	1479	1.85
Tires	369	.46	369	.46	369	.46	369	.46
TOTAL	8743	10.93	9540	11.92	10964	13.71	11981	14.97

CAR TYPE: Intermediate

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	2605	3.26	2638	3.30	2917	3.65	3070	3.84
Insurance	581	.73	1162	1.45	1743	2.18	2324	2.91
Finance	285	.36	649	.81	1181	1.48	1814	2.27
Licence	10	.01	20	.02	30	.03	40	.05
Sales Tax	519	.65	519	.65	519	.65	519	.65
Freight Charge	294	.37	294	.37	294	.37	294	.37
Gasoline	3299	4.12	3299	4.12	3299	4.12	3299	4.12
Maintenance	1479	1.85	1479	1.85	1479	1.85	1479	1.85
Tires	369	.46	369	.46	369	.46	369	.46
TOTAL	9441	11.80	10429	13.03	11831	14.78	13208	16.51

CAR TYPE: Full-size

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	3073	3.84	3121	3.90	3504	4.38	4326	5.41
Insurance	581	.73	1162	1.45	1743	2.18	2324	2.91
Finance	321	.40	764	.96	1397	1.75	2200	2.75
Licence	10	.01	20	.02	30	.03	40	.05
Sales Tax	565	.70	565	.70	565	.70	565	.70
Freight Charge	294	.37	294	.37	294	.37	294	.37
Gasoline	3417	4.27	3417	4.27	3417	4.27	3417	4.27
Maintenance	1479	1.85	1479	1.85	1479	1.85	1479	1.85
Tires	369	.46	369	.46	369	.46	369	.46
TOTAL	10109	12.63	11191	13.99	12798	16.00	15014	18.77

[1] Includes adjustment for mileage and geographic area

SUMMARY OF
TOTAL VEHICLE OPERATING COSTS Table 18

Region: NORTHEASTERN ONTARIO

CAR TYPE: Compact

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	2308	2.89	2181	2.73	2521	3.15	2420	3.02
Insurance	578	.72	1156	1.45	1734	2.16	2312	2.89
Finance	249	.31	582	.73	1075	1.34	1602	2.00
Licence	10	.01	20	.02	30	.03	40	.05
Sales Tax	463	.58	463	.58	463	.58	463	.58
Freight Charge	198	.25	198	.25	198	.25	198	.25
Gasoline	3010	3.76	3010	3.76	3010	3.76	3010	3.76
Maintenance	1463	1.83	1463	1.83	1463	1.83	1463	1.83
Tires	369	.46	369	.46	369	.46	369	.46
TOTAL	8648	10.81	9442	11.80	10863	13.58	11877	14.85

CAR TYPE: Intermediate

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	2605	3.26	2638	3.30	2917	3.65	3070	3.84
Insurance	578	.72	1156	1.45	1734	2.17	2312	2.89
Finance	285	.36	649	.81	1181	1.48	1814	2.27
Licence	10	.01	20	.02	30	.03	40	.05
Sales Tax	519	0.65	519	0.65	519	0.65	519	0.65
Freight Charge	198	.25	198	.25	198	.25	198	.25
Gasoline	3321	4.15	3321	4.15	3321	4.15	3321	4.15
Maintenance	1463	1.83	1463	1.83	1463	1.83	1463	1.83
Tires	369	.46	369	.46	369	.46	369	.46
TOTAL	9358	11.70	10333	12.92	11732	14.67	13106	16.38

CAR TYPE: Full-size

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	3073	3.84	3121	3.90	3504	4.38	4326	5.41
Insurance	578	.72	1156	1.45	1734	2.17	2312	2.89
Finance	321	.40	764	.96	1397	1.75	2200	2.75
Licence	10	.01	20	.02	30	.03	40	.05
Sales Tax	565	0.71	565	0.71	565	0.71	565	0.71
Freight Charge	198	.25	198	.25	198	.25	198	.25
Gasoline	3440	4.30	3440	4.30	3440	4.30	3440	4.30
Maintenance	1463	1.83	1463	1.83	1463	1.83	1463	1.84
Tires	369	.46	369	.46	369	.46	369	.46
TOTAL	10017	12.52	11096	13.87	12700	15.88	14913	18.64

[1] Includes adjustment for mileage and geographic area

SUMMARY OF
TOTAL VEHICLE OPERATING COSTS Table 18

Region: SOUTHWESTERN ONTARIO

CAR TYPE: Compact

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	2380	2.98	2250	2.81	2601	3.25	2497	3.12
Insurance	566	.71	1132	1.42	1698	2.12	2264	2.83
Finance	249	.31	582	.73	1075	1.34	1602	2.00
Licence	45	.06	90	.11	135	.17	180	.23
Sales Tax	463	.58	463	.58	463	.58	463	.58
Freight Charge	176	.22	176	.22	176	.22	176	.22
Gasoline	2968	3.71	2968	3.71	2968	3.71	2968	3.71
Maintenance	1571	1.96	1571	1.96	1571	1.96	1571	1.96
Tires	369	.46	369	.46	369	.46	369	.46
TOTAL	8787	10.98	9601	12.00	11056	13.82	12090	15.11

CAR TYPE: Intermediate

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	2670	3.34	2722	3.40	3010	3.76	3167	3.96
Insurance	566	.71	1132	1.42	1698	2.12	2264	2.83
Finance	285	.36	649	.81	1181	1.48	1814	2.27
Licence	60	.08	120	.15	180	.23	240	.30
Sales Tax	519	.65	519	.65	519	.65	519	.65
Freight Charge	176	.22	176	.22	176	.22	176	.22
Gasoline	3274	4.09	3274	4.09	3274	4.09	3274	4.09
Maintenance	1571	1.96	1571	1.96	1571	1.96	1571	1.96
Tires	369	.46	369	.46	369	.46	369	.46
TOTAL	9490	11.86	10532	13.16	11978	14.97	13394	16.74

CAR TYPE: Full-size

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	3170	3.96	3219	4.02	3615	4.52	4463	5.58
Insurance	566	.71	1132	1.42	1698	2.12	2264	2.83
Finance	321	.40	764	.96	1397	1.75	2200	2.75
Licence	60	.08	120	.15	180	.23	240	.30
Sales Tax	565	.71	565	.71	565	.71	565	.71
Freight Charge	176	.22	176	.22	176	.22	176	.22
Gasoline	3391	4.24	3391	4.24	3391	4.24	3391	4.24
Maintenance	1571	1.96	1571	1.96	1571	1.96	1571	1.96
Tires	369	.46	369	.46	369	.46	369	.46
TOTAL	10189	12.73	11307	14.13	12962	16.20	15239	19.04

[1] Includes adjustment for mileage and geographic area

SUMMARY OF
TOTAL VEHICLE OPERATING COSTS Table 18

Region: EASTERN ONTARIO

CAR TYPE: Compact

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	2380	2.98	2250	2.81	2601	3.25	2497	3.12
Insurance	566	0.71	1132	1.42	1698	2.12	2264	2.83
Finance	249	0.31	582	0.73	1075	1.34	1602	2.00
Licence	45	0.06	90	0.11	135	0.17	180	0.23
Sales Tax	463	0.58	463	0.58	463	0.58	463	0.58
Freight Charge	175	0.22	175	0.22	175	0.22	175	0.22
Gasoline	2968	3.71	2968	3.71	2968	3.71	2968	3.71
Maintenance	1497	1.87	1497	1.87	1497	1.87	1497	1.87
Tires	369	0.46	369	0.46	369	0.46	369	0.46
TOTAL	8712	10.89	9526	11.90	10981	13.72	12015	15.01

CAR TYPE: Intermediate

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	2670	3.34	2722	3.40	3010	3.76	3167	3.96
Insurance	566	0.71	1132	1.42	1698	2.12	2264	2.83
Finance	285	0.36	649	0.81	1181	1.48	1814	2.27
Licence	60	0.08	120	0.15	180	0.23	240	0.30
Sales Tax	519	0.65	519	0.65	519	0.65	519	0.65
Freight Charge	175	0.22	175	0.22	175	0.22	175	0.22
Gasoline	3274	4.09	3274	4.09	3274	4.09	3274	4.09
Maintenance	1497	1.87	1497	1.87	1497	1.87	1497	1.87
Tires	369	0.46	369	0.46	369	0.46	369	0.46
TOTAL	9415	11.77	10457	13.07	11903	14.87	13319	16.64

CAR TYPE: Full-size

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	3170	3.96	3219	4.02	3615	4.52	4463	5.58
Insurance	566	0.71	1132	1.42	1698	2.12	2264	2.83
Finance	321	0.40	764	0.96	1397	1.75	2200	2.75
Licence	60	0.08	120	0.15	180	0.23	240	0.30
Sales Tax	565	0.71	565	0.71	565	0.71	565	0.71
Freight Charge	175	0.22	175	0.22	175	0.22	175	0.22
Gasoline	3391	4.24	3391	4.24	3391	4.24	3391	4.24
Maintenance	1497	1.87	1497	1.87	1497	1.87	1497	1.87
Tires	369	0.46	369	0.46	369	0.46	369	0.46
TOTAL	10114	12.64	11232	14.04	12887	16.10	15164	18.95

[1] Includes adjustment for mileage and geographic area

SUMMARY OF
TOTAL VEHICLE OPERATING COSTS Table 18

Region: CENTRAL ONTARIO

CAR TYPE: Compact

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	2429	3.04	2296	2.87	2654	3.32	2548	3.19
Insurance	573	0.72	1146	1.43	1719	2.15	2292	2.87
Finance	249	0.31	582	0.73	1075	1.34	1602	2.00
Licence	45	0.06	90	0.11	135	0.17	180	0.23
Sales Tax	463	0.58	463	0.58	463	0.58	463	0.58
Freight Charge	151	0.19	151	0.19	151	0.19	151	0.19
Gasoline	2933	3.67	2933	3.67	2933	3.67	2933	3.67
Maintenance	1517	1.90	1517	1.90	1517	1.90	1517	1.90
Tires	369	0.46	369	0.46	369	0.46	369	0.46
TOTAL	8729	10.91	9547	11.93	11016	13.77	12055	15.07

CAR TYPE: Intermediate

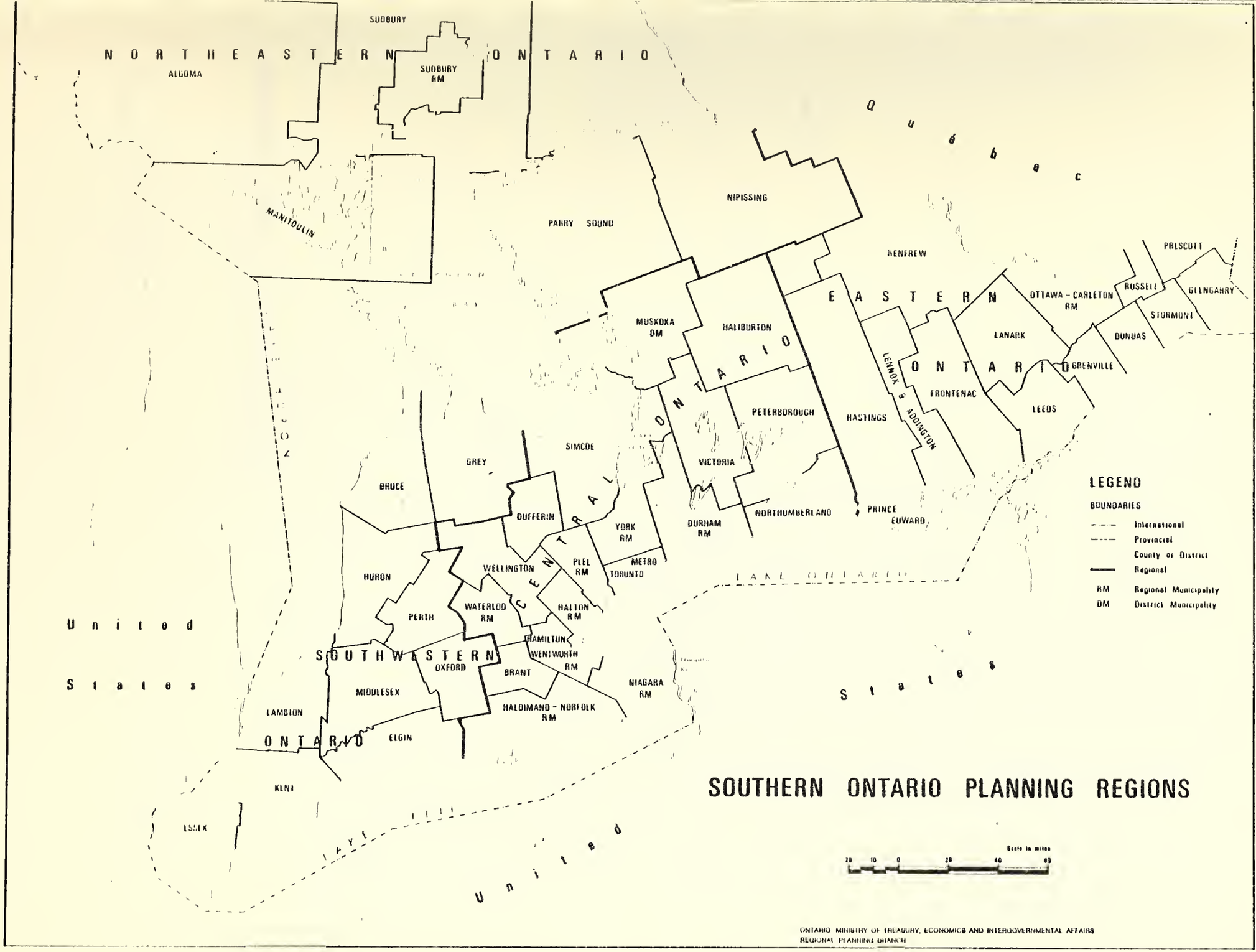
Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	2742	3.43	2777	3.47	3071	3.84	3232	4.04
Insurance	573	0.72	1146	1.43	1719	2.15	2292	2.87
Finance	285	0.36	649	0.81	1181	1.48	1814	2.27
Licence	60	0.08	120	0.15	180	0.23	240	0.30
Sales Tax	519	0.65	519	0.65	519	0.65	519	0.65
Freight Charge	151	0.19	151	0.19	151	0.19	151	0.19
Gasoline	3236	4.05	3236	4.05	3236	4.05	3236	4.05
Maintenance	1517	1.90	1517	1.90	1517	1.90	1517	1.90
Tires	369	0.46	369	0.46	369	0.46	369	0.46
TOTAL	9452	11.81	10484	13.11	11943	14.93	13370	16.71

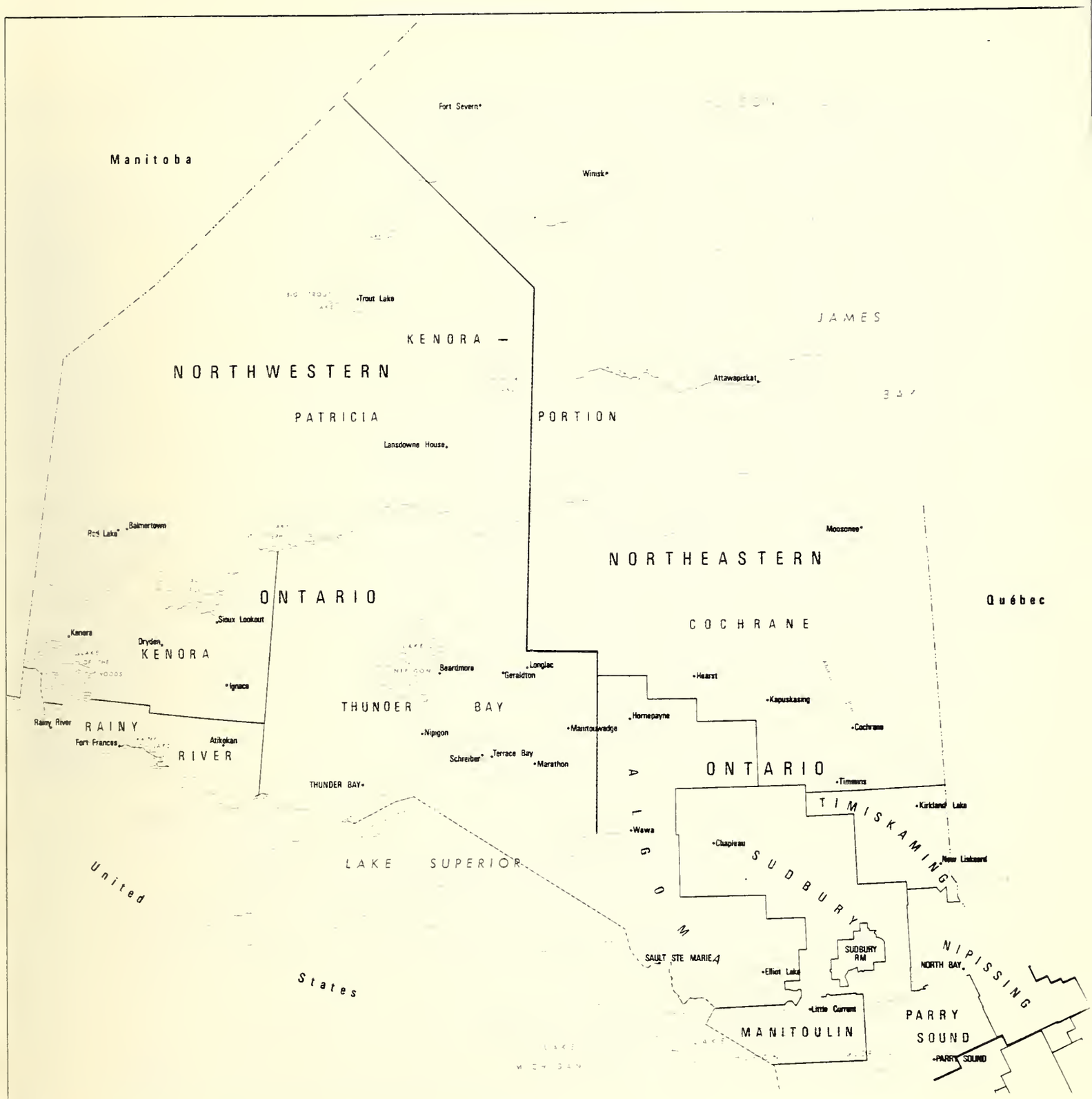
CAR TYPE: Full-size

Component Costs	1 Year		2 Years		3 Years		4 Years	
	Cost	¢/km	Cost	¢/km	Cost	¢/km	Cost	¢/km
Depreciation [1]	3235	4.04	3285	4.11	3689	4.61	4554	5.69
Insurance	573	0.72	1146	1.43	1719	2.15	2292	2.87
Finance	321	0.40	764	0.96	1397	1.75	2200	2.75
Licence	60	0.08	120	0.15	180	0.23	240	0.30
Sales Tax	565	0.71	565	0.71	565	0.71	565	0.71
Freight Charge	151	0.19	151	0.19	151	0.19	151	0.19
Gasoline	3351	4.19	3351	4.19	3351	4.19	3351	4.19
Maintenance	1517	1.90	1517	1.90	1517	1.90	1517	1.90
Tires	369	0.46	369	0.46	369	0.46	369	0.46
TOTAL	10142	12.68	11268	14.09	12938	16.17	15239	19.05

[1] Includes adjustment for mileage and geographic area

APPENDIX


NORTHEASTERN ONTARIO
SUDBURY
ALGOMA
SUDBURY RM
MANITOULIN
PARRY SOUND
NIPISSING
Quebec
HENFREW
PRESCOTT
RUSSELL
GLENGARRY
OTTAWA - CARLETON RM
STORMONT
DUNDAS
LANARK
GRENVILLE
EASTERN ONTARIO
MUSKOKA DM
HALIBURTON
LENNOX & ADDINGTON
FRONTENAC
LEEDS
HASTINGS
PETERBOROUGH
VICTORIA
CENTRAL ONTARIO
SIMCOE
GREY
BRUCE
DUFFERIN
YORK RM
DURHAM RM
NORTHUMBERLAND
PRINCE EDWARD
PEEL RM
METRO TORONTO
LAKE ONTARIO
HURON
WELLINGTON
WATERLOO RM
HALTON RM
PERTH
HAMILTON
WENTWORTH RM
SOUTHWESTERN ONTARIO
OXFORD
BRANT
NIAGARA RM
MIDDLESEX
HALDIMAND - NORFOLK RM
LAMBTON
ELGIN
KENT
ESSEX
LAKE ERIE
United States
United States
LEGEND
BOUNDARIES
International
Provincial
County or District
Regional
RM Regional Municipality
DM District Municipality
SOUTHERN ONTARIO PLANNING REGIONS
Scale in miles
20 10 0 20 40 60
ONTARIO MINISTRY OF TREASURY, ECONOMICS AND INTERGOVERNMENTAL AFFAIRS
REGIONAL PLANNING BRANCH



NORTHERN ONTARIO PLANNING REGIONS

LEGEND

BOUNDARIES

International — County or District

Provincial — Regional

RM Regional Municipality

Scale in miles

20 10 0 20 40 60 80 100 120 140 160

ONTARIO MINISTRY OF TREASURY ECONOMICS AND INTERGOVERNMENTAL AFFAIRS
REGIONAL PLANNING BRANCH

SURVEY OF GASOLINE PRICES

Estimate of Error

City	Sample Size n	Average (Reg.) $\bar{X}$	Variation S	Standard Error SE $(\bar{X})$[1]	%	Weight Ni/N^2
Thunder Bay	12	26.3	0.51	0.15	0.57	.03
Sault Ste. Marie	12	26.4	1.35	0.39	1.47	.02
Sudbury	12	26.6	1.03	0.30	1.12	.03
Windsor	12	26.6	1.06	0.31	1.16	.06
London	12	25.8	0.76	0.22	0.85	.07
Stratford	12	25.9	0.83	0.24	0.92	.01
Kingston	12	26.3	0.61	0.18	0.68	.02
Ottawa	12	26.0	0.66	0.19	0.73	.09
Oshawa	12	26.2	0.98	0.28	1.07	.03
Hamilton	12	25.5	1.23	0.36	1.41	.09
Niagara Falls	12	25.6	0.88	0.25	0.98	.02
Kitchener	12	26.1	1.22	0.35	1.34	.04
Toronto	12	25.8	1.30	0.38	1.47	.20
North York	12	25.8	0.59	0.22	0.85	.17
Scarborough	12	25.7	0.77	0.17	0.66	.11
ONTARIO	180	26.0	1.15	.098	0.38	1.0

Size of Sample

Based on the results of previous surveys, it was estimated with a confidence level of .95 that a sample of 12 outlets per city would result in the sample mean price being within $\pm$ .50 cents of the actual city gasoline price.

The results of the 1980 survey show that the city results varied between .33 and .86¢/litre of the actual gasoline price. The provincial gasoline price was estimated to be within .19¢/litre of the true value, with a confidence level of .95

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1 $\text{Var}\ (\bar{X}_w) = \sum Wi^2\ \text{Var}\ (\bar{X}c)$.

2 Weight = ratio of individual city populations to total population of cities.

SURVEY OF AUTOMOBILE MAINTENANCE COSTS

Estimate of Error

City/Strata	Sample Size n	Average $\bar{X}$[1]	Weight Ni/N	Variation S	Standard Error SE($\bar{X}$)	%
Thunder Bay	3	$618	.03	39	$22.5	3.6
Sault Ste. Marie	3	660	.02	54	31.2	4.7
Sudbury	3	571	.03	66	38.1	6.7
Windsor	2	701	.06	91	64.4	9.2
London	3	633	.07	51	29.4	4.6
Stratford	3	653	.01	61	35.2	5.4
Kingston	1	556	.02	--	----	---
Ottawa	4	641	.09	59	29.5	4.6
Oshawa	2	660	.03	7	5.0	0.8
Hamilton	2	597	.09	95	67.2	11.3
Niagara Falls	2	635	.02	4	2.8	0.4
Kitchener	2	652	.04	124	87.7	13.5
Toronto (inc. N.Y. & Scarb.)	5	660	.48	113	50.5	7.7
ONTARIO	35	639.7	1.0		25.8	4.0

Size of Sample

It is estimated, with a confidence level of .90 that a sample of 2 dealerships per city would result in the sample mean being within 4.4% of the actual cost of automotive maintenance over 80,000 kilometers.

The results of the survey indicate that the variation per city was larger than expected. Overall, a sample of 35 dealerships in Ontario resulted in the Ontario mean maintenance cost being within 8% of the true value, with a confidence level of .95.

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[1]Average maintenance cost excluding frequency of repair.

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